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Pericardial/Myocardial Disease

ASSOCIATION OF NONINVASIVELY MEASURED LEFT VENTRICULAR MECHANICS WITH IN-VITRO MUSCLE PERFORMANCE: A PROSPECTIVE STUDY OF HYPERTROPHIC CARDIOMYOPATHY PATIENTS UNDERGOING SURGICAL MYECTOMY

ACC Moderated Poster Contributions
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Background: Hypertrophic obstructive cardiomyopathy (HOCM) is a primary myopathic process associated with regional left ventricular (LV) abnormalities that predate overt LV dysfunction. Longitudinal strain & strain rate (SR) by speckle tracking echocardiography (STE) are sensitive markers of regional myocardial function. We sought to associate these parameters, obtained from basal septum (BS) preoperatively, to in-vitro muscle performance in post-surgical myectomy (SM) specimens.

Methods: 53 HOCM patients (age 51±20 years, 28 men) undergoing SM were recruited. Standard HOCM clinical & echocardiographic parameters were recorded. Segmental longitudinal strain & SR was measured at BS (part removed at SM) by tracking the mid-myocardium (VVI 2.0, Siemens). In-vitro measurements of resting (unstimulated state) & developed (20% above threshold voltage) tension (RT & DT) were made at Lmax, 60 beats/minute & 370 C, in the BS tissue obtained at SM.

Results: Mean BS thickness, maximal LV outflow gradient, LV ejection fraction were 2.1±0.5 cm, 94±41 mm Hg & 63±6%. Mean systolic strain (%), systolic & diastolic SR (1/s) at BS segment were -8.2±5, -0.62±0.3, 0.44±0.3. Mean RT & DT (g/mm2) of BS tissue were 2.93±1 & 1.40±0.7. Results of regression analysis, with RT & DT as dependent variables are shown in Figure.

Conclusion: There is a significant association between noninvasive parameters of LV mechanics (strain & SR) & in-vitro measurement of muscle performance (DT & RT), in HOCM patients.

Figure: Univariable regression analysis testing the association of resting and developed tension against clinical and noninvasive imaging markers

	Resting tension		Developed tension	
	Beta	P-value	Beta	P-value
Age	-0.017	0.9	-0.07	0.6
Gender	-0.045	0.8	-0.29	0.2
HTN	0.01	0.9	-0.03	0.8
CAD	0.20	0.2	0.13	0.4
Bundle branch block	-0.03	0.9	-0.07	0.7
LV ejection fraction (%)	-0.114	0.4	-0.16	0.3
Basal septal thickness (cm)	-0.112	0.4	-0.129	0.4
Maximal LVOTG (mm Hg)	0.18	0.2	-0.03	0.9
Diastology stage (I-IV)	-0.21	0.13	-0.23	0.12
Left atrial size (cm)	0.08	0.6	-0.13	0.4
Basal septal systolic strain (%)	-0.17	0.2	***-0.35***	***0.01***
Basal septal systolic SR (1/s)	-0.01	0.8	***-0.29***	***0.03***
Basal septal diastolic SR (1/s)	***-0.41***	***0.02***	***-0.23***	***0.09***

HTN = hypertension, CAD = coronary artery disease, LV = left ventricle, LVOTG = left ventricular outflow tract gradient, SR = strain rate